National Institute of Environmental Health Sciences

Novel vaccination approaches against equine alphavirus encephalitides

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Abstract:

The current production of inactivated vaccines for the prevention of equine alphavirus encephalitides caused by Eastern, Western and Venezuelan Equine Encephalitis viruses (EEEV, WEEV, VEEV) involves the manipulation of large quantities of infectious viral particles under biosafety level 3 containment laboratories with the potential risk of transmission to the operators. Moreover, these vaccines are not capable of inducing a long-lasting immunity. Modified live vaccines, which were also attempted, maintain residual virulence and neurotropism, causing disease in both horses and humans. Therefore, the production of an efficacious second generation vaccine which could be used in the prevention of alphavirus infection without the need to manipulate infectious viral particles under high biocontainment conditions could be of great benefit for the worldwide horse industry. Furthermore, equine alphaviruses are considered as biological threat agents. Subunit, chimeric, gene-deleted live mutants, DNA and adenovirus-vectored alphavirus vaccines have been evaluated; such approaches are reviewed in this work.Climate changes, together with modifications in bird and vector ecology, are leading to the arise of emerging pathogens in new geographical locations, and these zoonotic New World arboviruses are gaining concern. Novel vaccine development does show a promising future for prevention of these infections in both horses and humans.

Source: http://dx.doi.org/10.1016/j.vaccine.2013.11.071

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Food/Water Quality

Food/Water Quality: Pathogen

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Viral Encephalitis, Viral Encephalitis, Viral Encephalitis

Intervention:

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type:

format or standard characteristic of resource

Review

Timescale:

time period studied

Time Scale Unspecified